

CLAIMS

1. A method for displaying information showing the airspeed tolerance margins for an aircraft according to which:

- 5 a) the current angle of attack of the aircraft is determined;
- b) a longitudinal scale is defined which is a function of the aircraft's current aerodynamic configuration and which is composed of several differentiated zones  
10 expressed in angles of attack and corresponding, respectively, to an allowed range of flight, to first and second unrecommended ranges of flight and to first and second prohibited ranges of flight, said longitudinal scale comprising particular values of  
15 angle of attack corresponding respectively to:
  - a first flight limit which corresponds to the aircraft's stall airspeed augmented by a safety margin and which represents the minimum airspeed that can be set by the autopilot;
  - 20 - a second flight limit being higher than said first flight limit which, together with the latter, defines said allowed range of flight, said second flight limit corresponding to the maximum speed that the aircraft can assume with all its flaps  
25 deployed and without risk to its structural integrity, augmented by a normal loading margin;
  - a third flight limit being lower than said first flight limit which, together with the latter, defines said first unrecommended range of flight,  
30 and which defines said first prohibited range of flight being any value below said third flight limit, said third flight limit corresponding to the aircraft's stall airspeed; and
  - a fourth flight limit being higher than said  
35 second flight limit which, together with the latter, defines said second unrecommended range of flight, and which defines said second prohibited range of flight being any value exceeding said

fourth flight limit, said fourth flight limit corresponding to the maximum speed that the aircraft can assume with all its flaps deployed and without risk to its structural integrity, augmented by a reduced loading margin; and

5 c) said longitudinal scale is presented on a display screen and, being mobile in the longitudinal direction, is able to scroll up and down said display screen, and whose position on said display screen  
10 depends on the current angle of attack of the aircraft, which is indicated by a characteristic marker in a fixed position on said display screen across said longitudinal scale, said mobile longitudinal scale scrolling up and down relative to  
15 said characteristic marker as a function of the current angle of attack of the aircraft.

2. The method as claimed in claim 1, wherein, as a preliminary step, a plurality of longitudinal scales are defined which are respectively  
20 representative of different aerodynamic configurations of the aircraft, and wherein at step b):

- the current aerodynamic configuration of the aircraft is determined; and
- the longitudinal scale representative of said current  
25 aerodynamic configuration of the aircraft is selected from said plurality of longitudinal scales.

3. The method as claimed in claim 1, wherein said longitudinal scale is displayed vertically on said display screen, and wherein it is presented  
30 with the high angle of attack values toward the bottom and the lower angle of attack values toward the top.

4. The method as claimed in claim 1, wherein, at step a), the current angle of attack value is filtered, at least when the outside air is calm or  
35 when the outside air is turbulent.

5. The method as claimed in claim 1,

wherein said scale and said characteristic marker are presented on the display screen only when a main display is defective.

6. The method as claimed in claim 5,  
5 wherein:  
α) at least one of the aircraft's pressure sensors whose measurements are used by said main display is continuously monitored; and  
β) when a fault is detected in said pressure sensor, it  
10 is accordingly deduced that said main display is defective.

7. The method as claimed in claim 1,  
wherein said scale and said characteristic marker are presented on the display screen only while the aircraft  
15 is in flight.

8. The method as claimed in claim 1,  
wherein said zones of the longitudinal scale are differentiated from each other using different colors.

9. The method as claimed in claim 1,  
20 wherein said characteristic marker is a line drawn across said scale and is orthogonal to the longitudinal direction of the scale.

10. The method as claimed in claim 1,  
wherein, on the longitudinal scale, is provided:  
25 - a first written indication warning of a low airspeed of the aircraft in the zone relating to said first prohibited range of flight; and  
- a second written indication warning of a high airspeed of the aircraft in the zone relating to said  
30 second prohibited range of flight.

11. An aircraft flight indicator designed to provide information showing the airspeed tolerance margins, said flight indicator comprising:  
- a first means of determining the current angle of  
35 attack of the aircraft;  
- at least one database containing a plurality of longitudinal scales which depend on the aircraft's aerodynamic configuration and which are composed of

several differentiated zones expressed as angles of attack and corresponding, respectively, to one allowed range of flight, to first and second unrecommended ranges of flight and to first and second prohibited ranges of flight, each of said longitudinal scales comprising particular values of angle of attack corresponding respectively to:

- a first flight limit which corresponds to the aircraft's stall airspeed augmented by a safety margin and which represents the minimum airspeed that can be set by the autopilot;
- a second flight limit being higher than said first flight limit which, together with the latter, defines said allowed range of flight, said second flight limit corresponding to the maximum speed that the aircraft can assume with all its flaps deployed and without risk to its structural integrity, augmented by a normal loading margin;
- a third flight limit being lower than said first flight limit which, together with the latter, defines said first unrecommended range of flight, and which defines said first prohibited range of flight being any value below said third flight limit, said third flight limit corresponding to the aircraft's stall airspeed; and
- a fourth flight limit being higher than said second flight limit which, together with the latter, defines said second unrecommended range of flight, and which defines said second prohibited range of flight being any value exceeding said fourth flight limit, said fourth flight limit corresponding to the maximum speed that the aircraft can assume with all its flaps deployed and without risk to its structural integrity, augmented by a reduced loading margin;
- a central processing unit which selects, from said plurality of longitudinal scales, the longitudinal

scale representative of the current aerodynamic configuration of the aircraft; and

- a display means which presents on a display screen said selected longitudinal scale which, being mobile in the longitudinal direction, is able to scroll up and down said display screen, and whose position on said display screen depends on the current angle of attack of the aircraft, which is indicated by a characteristic marker in a fixed position on said display screen across said longitudinal scale, said mobile longitudinal scale scrolling up and down relative to said characteristic marker as a function of the current angle of attack of the aircraft.

12. The flight indicator as claimed in claim 11, wherein it additionally comprises a second means for determining the current aerodynamic configuration of the aircraft.

13. The flight indicator as claimed in claim 11, wherein said central processing unit filters the current angle of attack value as determined by said first means, at least when the outside air is calm or turbulent.

14. The flight indicator as claimed in claim 11, wherein it additionally comprises a detection means capable of detecting a failure of a main indicator, and wherein said display means present said scale and said characteristic marker on the display screen only when the failure of said main indicator is detected by said detection means.

15. An indication device designed to provide information on the airspeed tolerance margins, said indication device comprising a main indicator capable of presenting the airspeed tolerance margins on a display screen,

wherein it additionally comprises an auxiliary indicator designed to present information on the airspeed tolerance margins on a display screen when said main indicator is defective, and wherein said

auxiliary indicator corresponds to the flight indicator  
as claimed in claim 11.